

Claims

What is claimed is:

1. An electro-optical device comprising:
 - a first substrate;
 - a protection layer formed on the first substrate leaving a region of the first substrate exposed;
 - a first electrode formed on the protection layer;
 - a first inter-substrate conduction unit formed on the protection layer and electrically connected to the first electrode;
 - a second substrate opposing the first substrate and having a second electrode formed thereon;
 - a second inter-substrate conduction unit formed on the second substrate and electrically connected to the second electrode;
 - a conductive member interposed between the first inter-substrate conduction unit and the second inter-substrate conduction unit, to electrically connect both units together; and
 - a sealant that contains the conductive member bonding the first substrate and the second substrate together by extending on the protection layer and the exposed region of the first substrate where the protection layer is not formed.
2. A device according to Claim 1, wherein the exposed region of the first substrate extends inboard from an external periphery of the first substrate.

3. A device according to Claim 1, wherein a shape of the protection layer disposed at a bottom of the first inter-substrate conduction unit is coordinated with a shape of the first inter-substrate conduction unit.

4. A device according to Claim 1, wherein:

a color filter is formed at a lower layer of the protection layer disposed on the first substrate; and

the first substrate is larger than the second substrate so that an extended region of the first substrate produced when both the substrates are bonded together is provided with a mounting terminal to be connected to the first inter-substrate conduction unit.

5. An electro-optical device comprising:

a first substrate;

a protection layer formed on the first substrate leaving a region of the first substrate exposed;

a first electrode formed on the protection layer on the first substrate;

a first inter-substrate conduction unit formed on the protection layer and electrically connected to the first electrode;

a second substrate opposing the first substrate and having a second electrode formed thereon;

a second inter-substrate conduction unit formed on the second substrate and electrically connected to the second electrode;

a first wiring pattern formed on the first substrate and electrically connected to the first inter-substrate conduction unit;

a metallic wiring pattern formed at a lower layer of the protection layer and electrically connected to the first wiring pattern;

a conductive member interposed between the first inter-substrate conduction unit and the second inter-substrate conduction unit to electrically connect both units together; and

a sealant that contains the conductive member bonding the first substrate and the second substrate together by extending on the protection layer and the exposed region of the first substrate where the protection layer is not formed.

6. A device according to Claim 5, wherein:

a material of the first wiring pattern is the same as a material of the first inter-substrate conduction unit; and

a resistance of the metallic wiring pattern is smaller than a resistance of the first wiring pattern.

7. A device according to Claim 6, wherein the metallic wiring pattern comprises any one of silver, a silver alloy, aluminum, and an aluminum alloy.

8. A device according to Claim 5, wherein the exposed region of the first substrate extends inboard from an external periphery of the first substrate.

9. A device according to Claim 5, wherein a shape of the protection layer disposed at a bottom of the first inter-substrate conduction unit is coordinated with a shape of the first inter-substrate conduction unit.

10. An electro-optical device comprising:

a first substrate;

a protection layer formed on the first substrate leaving a region of the first substrate exposed;

a first electrode formed on the protection layer;

a first inter-substrate conduction unit formed on the protection layer and electrically connected to the first electrode;

a second substrate opposing the first substrate and having a second electrode formed thereon;

a second inter-substrate conduction unit formed on the second substrate and electrically connected to the second electrode;

a conductive member interposed between the first inter-substrate conduction unit and the second inter-substrate conduction unit, to electrically connect both units together; and

a sealant having a region that contains the conductive member and a region with a thickness larger than that of the region for embracing the conductive member so as to bond the first substrate and the second substrate together.

11. An electronic instrument comprising an electro-optical device according to claim 1.

12. A manufacturing method of an electro-optical device comprising the steps of:

forming a protection layer on a first substrate leaving a region of the first substrate region exposed;

forming a first inter-substrate conduction unit on a first substrate;
forming a second inter-substrate conduction unit on a second substrate;
and

applying a sealant so as to extend over the protection layer and the exposed region where the protection layer is not formed for bonding the first substrate and the second substrate together, the sealant embracing a conductive member disposed between the first inter-substrate conduction unit and the second inter-substrate conduction unit for electrically connecting both units together.

13. A manufacturing method of an electro-optical device comprising the steps of:

forming a metallic wiring pattern on a first substrate;

forming a protection layer on the metallic wiring pattern leaving a region of the first substrate exposed;

forming a first wiring pattern on the protection layer as well as on the metallic wiring pattern so as to connect both the patterns together while forming a first inter-substrate conduction unit on the protection layer so as to be electrically connected to the first wiring pattern; and

applying a sealant so as to extend over the protection layer and the exposed region where the protection layer is not formed, the sealant embracing a conductive member which is disposed between the first inter-substrate conduction unit and a second inter-substrate conduction unit disposed on a second substrate opposing the first substrate for electrically connecting both units together, the sealant bonding the first substrate and the second substrate together.